AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

16. (currently amended): In a machine system, an apparatus for controlling an electric motor, comprising:

a simulator section ~~consisting of~~ further comprising:

a position instruction generator for providing a real position instruction;~~,~~

a numerical model that simulates said machine system and provides a simulation quantity of state on the basis of a simulation torque signal;

a simulation controller that provides said numerical model with the ~~a~~ simulation torque signal on the basis of said simulation quantity of state, a simulation control parameter and a first simulation position instruction signal;~~,~~ and

an evaluation section that provides a real control parameter, a simulation control parameter, and a first simulation position signal on the basis of said real position instruction and said simulation quantity of state; and

a real controller section ~~that has the same structure as that of said simulation controller,~~ ~~and~~ that provides a real torque signal to an electric motor, ~~which is a source of drive,~~ on the basis of said real position instruction, said real control parameter and a real quantity of state observable from a real system.

17. (currently amended): In a machine system, an apparatus for controlling an electric motor, comprising:

a simulator section ~~consisting of~~ further comprising:

a position instruction generator for providing a real position instruction;~~,~~

a numerical model that simulates said machine system and provides a simulation quantity of state on the basis of a simulation torque signal;

a simulation controller that provides said numerical model with the~~a~~ simulation torque signal on the basis of said simulation quantity of state, a simulation control parameter and a first simulation position instruction signal, and

an evaluation section that provides a real control parameter, a simulation control parameter, and a first simulation position signal on the basis of said real position instruction and said simulation quantity of state by a means of a genetic algorithm; and

a real controller section ~~that has the same structure as that of said simulation controller, and~~ that provides a real torque signal to an electric motor~~, which is a source of drive,~~ on the basis of said real position instruction, said real control parameter and a real quantity of state observable from a real system.

18. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 16, wherein said apparatus is provided with a means for supplying control parameters, which are obtained by the evaluation unit of said simulation section to the real

control section after said simulation section is driven prior to a real operation and a simulation evaluation function for evaluating the behaviors of said numerical model satisfies the initial conditions established in advance.

19. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 18, wherein said apparatus is provided with said numerical model that provides a simulation speed signal and a simulation position signal based on a simulation torque with respect to a given real position instruction; a simulation PI controlling section that provides a simulation torque instruction to said numerical model on the basis of the simulation speed signal and simulation position signal of said numerical model; and a real PI controlling section that provides a real torque signal on the basis of said real position instruction, real position signal and real speed signal.

20. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 18, wherein said apparatus is provided with a numerical model that provides a simulation position signal on the basis of a simulation torque instruction with a respect to a given real position instruction; a simulation PID controlling section that provides said numerical model with said simulation torque instruction on the basis of a simulation position signal of said numerical model; and a real PID controlling section that provides a real torque signal on the basis of said real position instruction and said real position signal.

21. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 18, wherein said apparatus is provided with a numerical model that provides a simulation speed signal on the basis of a simulation torque instruction with respect to a given real speed instruction; a simulation PID controlling section that provides said numerical model with a simulation torque instruction on the basis of said simulation speed signal of said numerical model; and a real PI controlling section that provides a real torque signal on the basis of said real speed instruction and real speed signal.

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22. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 19, wherein said apparatus is provided with a simulation controlling section consisting of a simulation PID controlling section, which provides said numerical model with a simulation torque instruction on the basis of the simulation speed signal and simulation position signal of said numerical model, and a simulation compensating section; and a real controlling section consisting of a real PID controlling section that provides a real torque signal based on the real position instruction, real position signal and real speed signal, and a real compensating section.

23. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 20, wherein said apparatus is provided with a simulation controlling section consisting of a simulation PID controlling section, which provides said numerical model with a simulation torque instruction on the basis of the simulation position signal of said numerical

model, and a simulation compensating section; and a real controlling section consisting of a real PID controlling section, which provides a real torque on the basis of the real position instruction and real position signal; and a real controlling section.

24. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 21, wherein said apparatus is provided with a real controlling section consisting of a simulation PI controlling section that provides said numerical model with a simulation torque instruction on the basis of a simulation speed signal of said numerical model, a simulation compensating section, a real PI controlling section that provides a real torque signal on the basis of a real speed instruction and said real speed signal, and a real compensating section.

25. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 19, wherein said apparatus is provided with a simulation controlling section that is constructed of a simulation PID controlling section, which provides said numerical model with a simulation torque instruction on the basis of a simulation speed signal of said numerical model and a simulation position signal thereof, and a simulation controlling section consisting of a plurality of types of simulation compensators; and a real controlling section that is constructed of a real PID controlling section, which provides a real torque signal on the basis of a real position instruction, said real position signal and said real speed signal, and a real compensating section consisting of a plurality of types of said real compensators.

26. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 20, wherein said apparatus is provided with a simulation controlling section that is constructed of a simulation PID controlling section, which provides said numerical model with a simulation torque instruction on the basis of a simulation position signal of said numerical model, and a simulation compensating section consisting of a plurality of types of simulation compensators; and a real controlling section that is constructed of a real PID controlling section, which provides a real torque signal on the basis of a real position instruction and said real position signal, and a real compensating section consisting of a plurality of real compensators.

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27. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 21, wherein said apparatus is provided with a simulation controlling section that is constructed of a simulation PI controlling section, which provides said numerical model with a simulation torque instruction on the basis of a simulation speed signal of said numerical model, and a simulation compensating section consisting of a plurality of types of simulation compensators; and a real controlling section that is constructed of a real PI controlling section, which provides a real torque signal on the basis of a real speed instruction and said real speed signal, and a real compensating section consisting of a plurality of real compensators.

28. (previously presented): The apparatus for controlling an electric motor as set forth in claim 16, wherein said apparatus comprise a numerical model by using an observable quantity of state, which is obtained by driving the real system based on the initial controlling

parameters initially established by the real controlling section, and an initial torque instruction given to a real driving section in the initial state where said numerical model is constituted; driving the real system after the controlling parameters are provided; re-determining said numerical model by, where the behaviors of the real system do not satisfy the on-real running evaluation function established in advance, using the real running torque instruction at that time and the observable quantity of real running state of the real system; and re-starting the simulator section to re-determine the controlling parameters in said evaluation section.

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29. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 28, wherein said apparatus includes a simulation controlling section that is constructed of a simulation PID controlling section, which provides said numerical model with a simulation torque instruction on the basis of a simulation speed signal of said numerical model and simulation position signal thereof, and a simulation compensating section consisting of a plurality of types of simulation compensators; and a real controlling section that is constructed of a real PID controlling section, which provides a real torque signal on the basis of a real position instruction, said real position signal and said real speed signal, and a real compensating section consisting of a plurality of real compensators.

30. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 28, wherein said apparatus includes a simulation controlling section that is constructed of a simulation PID controlling section, which provides said numerical model with a

simulation torque instruction on the basis of a simulation position signal of said numerical model, and a simulation compensating section consisting of a plurality of types of simulation compensators; and a real controlling section that is constructed of a real PID controlling section, which provides a real torque signal on the basis of a real position instruction and said real position signal, and a real compensating section consisting of a plurality of real compensators.

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31. (previously presented): The apparatus for controlling an electric motor as set forth in Claim 28, wherein said apparatus includes a simulation controlling section that is constructed of a simulation PI controlling section, which provides said numerical model with a simulation torque instruction on the basis of a simulation speed signal of said numerical model, and a simulation compensating section consisting of a plurality of types of simulation compensators; and a real controlling section that is constructed of a real PI controlling section, which provides a real torque signal on the basis of a real speed instruction and said real speed signal, and a real compensating section consisting of a plurality of real compensators.